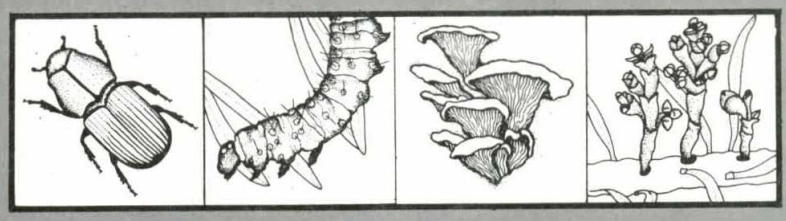
Forest Pest Management



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EVALUATION OF DWARF MISTLETOE CONTROL PROJECTS ON THE WEST FORK RANGER DISTRICT, BITTERROOT NATIONAL FOREST

by

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ABSTRACT

Many residual Douglas-fir are infested by dwarf mistletoe and pose a threat to regeneration. Felling or girdling these residuals, along with sanitation/ thinning of dense patches of regeneration, will reduce dwarf mistletoe intensity and increase future volume yields of Douglas-fir. The benefit/cost ratios at 4 percent and 7-1/8 percent discount rates for the current rotation are 0.12/1 and <0.01/1, respectively. Elimination of dwarf mistletoe infestation for several rotations will increase benefits. Value added to the economy cannot be used in benefit/cost analysis, but it will be substantial. Control is recommended.

INTRODUCTION

The West Fork Ranger District has proposed two control projects:

1. Piquett Creek, Stand 50-4-02.--Presuppression survey, removal of old growth dwarf mistletoe-infested Douglas-fir, and thinning/ sanitation of understory on 60 acres.

2. Buck Creek, Stand 53201.--Same as Piquett Creek on 27 acres.

Stan Underwood and Don King, West Fork RD, and I evaluated the two areas on October 23. We discussed management alternatives available to the District.

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TECHNICAL INFORMATION

Causal agent.--Douglas-fir dwarf mistletoe, Arceuthobium douglasii.

Host.--Douglas-fir, Pseudotsuga menziesii.

Type of damage.--Reduction of tree vigor, height, and diameter growth, along with some mortality. My estimate for average volume loss in infested Douglas-fir type in the Bitterroot area due to A. douglasii is 20 cubic feet per acre per year. Dwarf mistletoe-infested trees and stands are also more vulnerable to attack by other pathogens and insects.

STAND DESCRIPTIONS

Proposed control units are east of the West Fork Bitterroot River near the West Fork Ranger Station (figure 1).

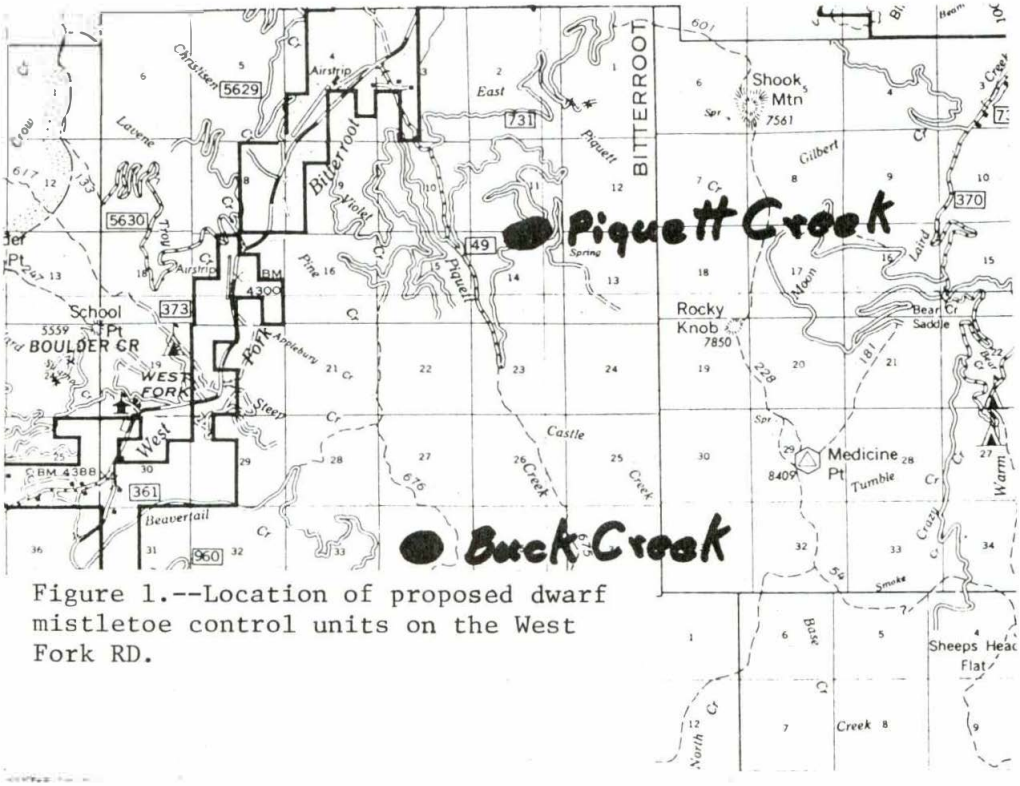

Figure 1.--Location of proposed dwarf mistletoe control units on the West Fork RD.

Piquett Creek.--This stand was clearcut, terraced, and planted to ponderosa pine 10 to 15 years ago. Residual Douglas-fir and lodgepole pine are scattered throughout the stand. Most of the Douglas-fir residuals are dwarf mistletoe-infested. Douglas-fir and lodgepole pine regeneration has established naturally in much of the stand. Site index is estimated at 40 to 50, based on Pfister's habitat types.

This stand is part of Management Unit 6 in the Lower West Fork Land Use Plan. Primary objective is to "manage intensively for timber production, modifying such management when needed to protect big game winter range and to prevent soil erosion and the degrading of water quality below State standards." None of the area within or adjacent to the stand is classed as key big game winter range.

Buck Creek.--This stand was also clearcut, terraced, and planted to ponderosa pine 10 to 15 years ago. Residual Douglas-fir, subalpine fir, and lodgepole pine are scattered throughout the stand. Most of the Douglas-fir residuals are dwarf mistletoe-infested. Douglas-fir regeneration has established naturally in much of the stand. Site index is estimated at 40 to 50.

This stand is also part of Management Unit 6 in the Lower West Fork Land Use Plan. The objective is the same as for Piquett Creek. None of the area within or adjacent to the stand is classed as key big game winter range. Some of the larger green trees and snags are considered important for various bird species.

MANAGEMENT ALTERNATIVES

1. Defer treatment.--Potential yields would be 40 to 50 percent lower than in alternative 2. Dwarf mistletoe infestation would become worse. This alternative has the advantage of requiring the least investment.

2. Fell or girdle infested residual Douglas-fir and thin/sanitize regeneration.--This would maximize yields and largely eliminate dwarf mistletoe from the Douglas-fir.

PREFERRED ALTERNATIVE

Preferred treatment (alternative 2) is to fell or girdle residual Douglas-fir and thin/sanitize Douglas-fir regeneration.

ECONOMIC ANALYSIS

Mixed species yield projections for the two stands show these volumes and values:

Cutting year	Healthy stand (MBF/acre)	Infested stand (MBF/acre)	Recovery w/treatment (MBF/acre)	Value -1/ ($/MBF)	Total value ($)
1982	0	0	0	$ 0	$ 0
2067	2	0	2	100	200
2107	15	8	7	100	700
Totals	17	8	9	-	$900

1/ Last 5-year sales average for Forest.

Stumpage values are currently low, and they do not remain constant for long periods. Historically, they have increased at an annual rate of about 3 percent.

By applying a 4 percent discount rate to the values obtained above, the present net worth (PNW) of dwarf mistletoe treatment per acre is:

Time (years)	Dollar value	Discount factor 1/	PNW ($)
85	$200	.035659	7.32
125	700	.007427	5.20
Totals	$900	-	$12.52

1/ Present value of $1 for n years @ 4 percent.

Cost of treatment will average $108 per acre for the two stands. By dividing the PNW of the benefits ($12.52) by the treatment cost ($108), the benefit/cost ratio (B/C) is 0.12/1, or a return of only 12 cents for each dollar invested.

By applying a 7-1/8 percent discount rate to the same values, the PNW of treatment is:

Time (years)	Dollar value	Discount factor 1/	PNW ($)
85	$200	.002879	$0.58
125	700	.00184	0.13
Totals	$900	-	$0.71

1/ Present value of $1 for n years @ 7-1/8 percent.

B/C at this discount rate is less than .01/1.

DISCUSSION

Recovery of volume losses through dwarf mistletoe control could generate additional employment in the forest products industry and result in what economists call "value added." While value added cannot be used in a B/C analysis, it is substantial enough to be considered when determining overall benefits. Each million board feet of timber cut creates 10.56 person years of employment, paying an average of $16,784 per person per year. For the proposed control units, this translates into the generation of 0.02 and 0.07 years of employment in 85 and 125 years, respectively. The increased employment would add $1,510.56 to the economy for each acre in the treatment areas.

National and Regional policy is to grow timber on the Bitterroot NF. In following this policy we are investing public money with the expectation of future gain.

In the mistletoe treatment area, we are making the investment for reasons other than financial gain. Overall benefits of reducing or eliminating dwarf mistletoe for more than one rotation, and the social and community benefits of increased present and future employment outweigh strict financial considerations.

RECOMMENDATION

Reduction of dwarf mistletoe impact through silvicultural practices is biologically sound. I recommend the use of insect and disease funds for the projects. Because control will be by felling scattered cull trees from areas already clearcut, there will be no additional adverse impact on other resources. The projects are neither major nor controversial, and do not need environmental analyses.